

What is claimed is:

1. An image pickup device comprising:

(a) a base board on which an opening portion is formed;

(b) an image pickup element provided on a reverse surface of the base board so that at least a part of the opening portion is covered;

(c) an optical member for converging light incident on the image pickup element, the optical member being provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion; and

(d) an outer frame member provided on the base board to cover the optical member and the opening portion.

2. The image pickup device of claim 1, wherein the optical member comprises a portion to be engaged that is interfitted in the outer frame member to prevent that the optical member rotates about an optical axis of the optical member, and the outer frame member comprises an engaging portion that is interfitted in the portion of the optical member.

3. The image pickup device of claim 1, wherein the optical member comprises a first optical member that comes in contact with a surface of the image pickup element, and at least one auxiliary optical member which is stacked on the first optical member so that an optical axis of the auxiliary optical member agrees with an optical axis of the first optical member.

4. The image pickup device of claim 1, wherein the base board has electric parts thereon for processing an image.

5. The image pickup device of claim 1, wherein prescribed electric parts are arranged on the base board that is covered by the outer frame member.

6. The image pickup device of claim 4, wherein at least a part of the electric parts is arranged in the vicinity of a fixed position at which the outer frame member is fixed.

7. The image pickup device of claim 4, wherein a photo-electric conversion section is provided on the front surface at a position corresponding to the opening portion to convert incident light to an electric signal, and the optical member

is arranged to focus an object image by converging the incident light onto the photo-electric conversion section.

8. A portable terminal comprising:

(a) an image pickup device comprising:

(1) a base board on which an opening portion is formed,

(2) an image pickup element provided on a reverse surface of the base board so that at least a part of the opening portion is covered,

(3) an optical member for converging light incident on the image pickup element, the optical member being provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion, and

(4) an outer frame member provided on the base board to cover the optical member and the opening portion; and

(b) a casing in which the image pickup device is provided.

9. The image pickup device of claim 1, wherein the base board is a flexible base board, and the opening portion is formed in a way that each corner portion of an approximate polygon of the opening portion is cut off outwardly.

10. The image pickup device of claim 9, wherein each of four corner portions of an approximate rectangle of the opening portion is formed to be in a cutout form outwardly.

11. The image pickup device of claim 9, wherein the cutout portion of the opening portion is formed to be tapered off toward an outer edge portion of the flexible base board.

12. The image pickup device of claim 9, wherein the cutout portion of the opening portion is a circular form approximately, and the optical member is structured to touch a surface of the image pickup element through the cutout portion.

13. The image pickup device of claim 9, wherein the image pickup element and an electric connecting portion are formed along an inner edge portion of the opening portion on the flexible base board.

14. The image pickup device of claim 13, wherein each cutout portion is formed to be closer to an outer edge side of the flexible base board than a point of intersection of

two extended lines of the electric connecting portions formed respectively along adjoining inner edge portions is.

15. The image pickup device of claim 9, wherein a difference in a coefficient of linear expansion between the flexible base board and the image pickup element is 25 - 36 ppm/°C.

16. A portable terminal comprising:

(a) an image pickup device comprising:

(1) a flexible base board equipped with an opening portion,

(2) an image pickup element mounted on a reverse side of the flexible base board so that a part of the opening portion is covered and an image pickup area is exposed to an outside, and

(3) an optical member for converging incident light on the image pickup area of the image pickup element, wherein the optical member is provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion and the opening portion is formed in a way that each corner portion

of an approximate polygon of the opening portion is cut off outwardly, and

(4) an outer frame member provided on the base board to cover the optical member and the opening portion; and

(b) a casing in which the image pickup device is provided.

17. An image pickup device comprising:

(a) a flexible base board equipped with an opening portion;

(b) an image pickup element mounted on a reverse side of the flexible base board so that a part of the opening portion is covered and an image pickup area is exposed to an outside; and

(c) an optical member for converging incident light on the image pickup area of the image pickup element, wherein the opening portion is formed in a way that each corner portion of an approximate polygon of the opening portion is cut off outwardly.

18. The image pickup device of claim 17, wherein each of four corner portions of an approximate rectangle of the opening portion is formed to be in a cutout form outwardly.

19. The image pickup device of claim 17, wherein the cutout portion of the opening portion is formed to be tapered off toward an outer edge portion of the flexible base board.

20. The image pickup device of claim 17, wherein the cutout portion of the opening portion is a circular form approximately, and the optical member is structured to touch a surface of the image pickup element through the cutout portion.

21. The image pickup device of claim 17, wherein the image pickup element and an electric connecting portion are formed along an inner edge portion of the opening portion on the flexible base board.

22. The image pickup device of claim 21, wherein each cutout portion is formed to be closer to an outer edge side of the flexible base board than a point of intersection of two extended lines of the electric connecting portions formed respectively along adjoining inner edge portions is.

23. The image pickup device of claim 17, wherein a difference in a coefficient of linear expansion between the flexible base board and the image pickup element is 25 - 36 ppm/°C.

24. A portable terminal comprising:

(a) An image pickup device comprising:

(1) a flexible base board equipped with an opening portion,

(2) an image pickup element mounted on a reverse side of the flexible base board so that a part of the opening portion is covered and an image pickup area is exposed to an outside, and

(3) an optical member for converging incident light on the image pickup area of the image pickup element, wherein the opening portion is formed in a way that each corner portion of an approximate polygon of the opening portion is cut off outwardly; and

(b) a casing in which the image pickup device is provided.

25. The image pickup device of claim 1, further comprising:

a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other; and

a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board,

wherein adhesives are filled in a space between the connecting member and the weir member.

26. The image pickup device of claim 25, wherein the weir member is provided outside a side end portion of the image pickup element, and the adhesives are filled in a space between the side end portion of the image pickup element and the weir member.

27. The image pickup device of claim 25, wherein the weir member is a frame-shaped member, and is arranged on the base board so that the image pickup element is positioned inside the frame-shaped member.

28. The image pickup device of claim 25, wherein a length of the weir member in a projecting direction thereof

is shorter than a distance between the reverse side of the base board and the reverse side of the image pickup element.

29. The image pickup device of claim 25, wherein the adhesives are either one of UV-setting type adhesives, thermosetting type adhesives and UV-heat setting type adhesives.

30. A portable terminal comprising:

(a) an image pickup device comprising:

(1) a base board on which an opening portion is formed,
(2) an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion,

(3) an optical member for converging incident light on the image pickup element, the optical member being provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion,

(4) an outer frame member provided on the base board to cover the optical member and the opening portion,

(5) a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and

(6) a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board,

wherein adhesives are filled in a space between the connecting member and the weir member; and

(b) a casing in which the image pickup device is provided.

31. An image pickup device comprising:

(a) a base board on which an opening portion is formed;

(b) an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion;

(c) an optical member for converging incident light on the image pickup element;

(d) a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other; and

(e) a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board,

wherein adhesives are filled in a space between the connecting member and the weir member.

32. The image pickup device of claim 31, wherein the weir member is provided outside a side end portion of the image pickup element, and the adhesives are filled in a space between the side end portion of the image pickup element and the weir member.

33. The image pickup device of claim 31, wherein the weir member is a frame-shaped member, and is arranged on the base board so that the image pickup element is positioned inside the frame-shaped member.

34. The image pickup device of claim 31, wherein a length of the weir member in a projecting direction thereof is shorter than a distance between the reverse side of the base board and the reverse side of the image pickup element.

35. The image pickup device of claim 31, wherein the adhesives are either one of UV-setting type adhesives, thermosetting type adhesives and UV-heat setting type adhesives.

36. A portable terminal comprising:

(a) an image pickup device comprising:

(1) a base board on which an opening portion is formed,
(2) an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion,

(3) an optical member for converging incident light on the image pickup element,

(4) a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and

(5) a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board, wherein adhesives are filled in a space between the connecting member and the weir member; and

(b) a casing in which the image pickup device is provided.

37. A manufacturing method of an image pickup device comprising a base board on which an opening portion is formed an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion an optical member for converging incident light on the image pickup element, the optical member being provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion, an outer frame member provided on the base board to cover the optical member and the opening portion, a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board, wherein adhesives are filled in a space between the connecting member and the weir member,

said manufacturing method comprising the steps of:

(a) arranging the weir member at a prescribed position on the base board;

(b) mounting the image pickup element on the reverse side of the base board through the connecting member so that

an image pickup area of the image pickup element is exposed to the surface side of the base board from the opening portion;

(c) filling in a space between the weir member and the connecting member the adhesives which are set by at least one of heat and ultraviolet rays; and

(d) hardening the adhesives filled in a space between the weir member and the connecting member with at least either one of heat and ultraviolet rays.

38. The manufacturing method of claim 37, wherein the step of the hardening comprises radiating heat or ultraviolet rays from a radiating device arranged to be capable of radiating heat or ultraviolet rays directly on the adhesives filled in the space between the base board and the image pickup element through the opening portion from the outside of the opening portion.

39. The manufacturing method of claim 37, wherein the filling of adhesives and the radiating of heat or ultraviolet radiation from the radiating device are conducted simultaneously.

40. A manufacturing method of an image pickup device comprising a base board on which an opening portion is formed an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion an optical member for converging incident light on the image pickup element, the optical member being provided so as to come in contact with a front surface of the image pickup element from the front surface of the base board through the opening portion, an outer frame member provided on the base board to cover the optical member and the opening portion, a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board, wherein adhesives are filled in a space between the connecting member and the weir member,

said manufacturing method comprising the steps of:

(a) mounting the image pickup element on the reverse side of the base board through the connecting member so that an image pickup area of the image pickup element is exposed to the surface side of the base board from the opening portion;

(b) filling adhesives which are set by at least either one of heat and ultraviolet radiation at a prescribed position between the reverse side of the base board and the surface side of the image pickup element;

(c) hardening the adhesives filled in the space between the base board and the image pickup element by at least either one of heat and ultraviolet radiation for tentative fixing;

(d) arranging the weir member at the prescribed position on the base board on the adhesives fixed tentatively; and

(e) hardening the adhesives fixed tentatively for regular fixing.

41. A manufacturing method of an image pickup device comprising a base board on which an opening portion is formed, an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion, an optical member for converging incident light on the image pickup element, a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and a weir member provided to be projected from the

surface side of the image pickup element outside the connecting member on the reverse side of the base board, wherein adhesives are filled in a space between the connecting member and the weir member,

said manufacturing method comprising the steps of:

(a) arranging the weir member at a prescribed position on the base board;

(b) mounting the image pickup element on the reverse side of the base board through the connecting member so that an image pickup area of the image pickup element is exposed to the surface side of the base board from the opening portion;

(c) filling in a space between the weir member and the connecting member the adhesives which are set by at least one of heat and ultraviolet rays; and

(d) hardening the adhesives filled in a space between the weir member and the connecting member with at least either one of heat and ultraviolet rays.

42. The manufacturing method of claim 41, wherein the step of the hardening comprises radiating heat or ultraviolet rays from a radiating device arranged to be capable of radiating heat or ultraviolet rays directly on the adhesives

filled in the space between the base board and the image pickup element through the opening portion from the outside of the opening portion.

43. The manufacturing method of claim 42, wherein the filling of adhesives and the radiating of heat or ultraviolet radiation from the radiating device are conducted simultaneously.

44. A manufacturing method of an image pickup device comprising a base board on which an opening portion is formed, an image pickup element mounted on a reverse side of the base board to cover at least a part of the opening portion, an optical member for converging incident light on the image pickup element, a connecting member for connecting electrically the reverse side of the base board and a front side of the image pickup element which are spaced from each other, and a weir member provided to be projected from the surface side of the image pickup element outside the connecting member on the reverse side of the base board, wherein adhesives are filled in a space between the connecting member and the weir member,

said manufacturing method comprising the steps of:

(a) mounting the image pickup element on the reverse side of the base board through the connecting member so that an image pickup area of the image pickup element is exposed to the surface side of the base board from the opening portion;

(b) filling adhesives which are set by at least either one of heat and ultraviolet radiation at a prescribed position between the reverse side of the base board and the surface side of the image pickup element;

(c) hardening the adhesives filled in the space between the base board and the image pickup element by at least either one of heat and ultraviolet radiation for tentative fixing;

(d) arranging the weir member at the prescribed position on the base board on the adhesives fixed tentatively; and

(e) hardening the adhesives fixed tentatively for regular fixing.